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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/586,221	07/14/2006	Christos Aneziris	0003036USU/2266	2730
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OHLANDT, GREELEY, RUGGIERO & PERLE, LLP ONE LANDMARK SQUARE, 10TH FLOOR STAMFORD, CT 06901			EXAMINER HOBAN, MATTHEW E	
			ART UNIT	PAPER NUMBER
			1793	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/586,221	<b>Applicant(s)</b> ANEZIRIS ET AL.	
	<b>Examiner</b> Matthew E. Hoban	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-18 and 20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 10-15, 17-18 and 20 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 10-13, 15, 17-18 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Kunkele in 4115133 in view of Boenigk in 5262043.

**Regarding Claim 10:** Kuenkele teaches a process wherein carbon bonded refractory products are made. The process includes mixing the components of said refractory in the cold condition and then mechanically or hydraulically forming the mixture into a shape under pressure (green body). This body is then dried and tempered at a temperature generally from 250-300C. The components of the refractory oxides which were mixed together comprise chrome ore having several oxides, magnesia, pitch, carbon and optionally an impregnating oil. The content of the components of immediate interest are as follows: pitch content of 2-7 wt%, carbon content of 1.5-5 wt% and lubricating oil content of .5-2.5 wt%. The impregnating oil preferably is an anthracene oil (liquid). The BaP content in anthracene oil is inherently 100-500 ppm (Exemplary document: 6010617, Column 2, Lines 23-24). The claimed "organic binder" comprises a graphitable pitch and a liquid graphitable binder, wherein the liquid graphitable binder is made up of aromatic oil and the aforementioned pitch. Therefore, the combination of the pitch of Kuenkele with the lubricating anthracene oil clearly reads on the claimed subject matter as Kuenkele teaches a pitch and anthracene binder. The combination of pitch and anthracene and pitch alone therefore can be arbitrarily construed within the bounds of the claims since both components are integrally mixed in the process.

Art Unit: 1793

Kuenkele teaches the general use of pitch in his carbon bonded refractory as a constituent carbon source and does not anticipate or clearly teach a pitch with the specific properties claimed or way in which such a pitch could be produced.

However, Boenigk teaches a pitch useful for binding such materials having a BAP content of below 500 mg/kg and a coking value above 80%. This pitch can be seen in Examples 1 and 2. When this pitch is combined with the components of Kuenkele's invention it results in a composition having the claimed benzo[a]pyrene and coking value constraints. The fact, that the graphitable binder would include a portion of the added pitch, would mean that this graphitable binder would have the claimed BAP and coking values. For example, if 5 wt% pitch and 2 wt% anthracene oil was added, the graphitable binder could be construed as the portion of this composition comprising the 2 wt% anthracene oil and 2 wt% pitch, wherein the other 3 wt% pitch comprises the graphitable pitch. Therefore the graphitable binder would have a coking value of at least 50% of the value of the pitch alone (in other words greater than 40%) and a benzo-[a]-pyrene content of between 67.5-267.5 ppm (based on the content of both constituents). Therefore the combination of these two references leads to a process of making a composite meeting all claimed limitations. Furthermore, the combination of references would be obvious based on the fact that Kuenkele teaches a process involving the use of a graphitable pitch as a bonding agent, wherein the pitch of Boenigk is an improved pitch having a lower benzo-[a]-pyrene content. One of ordinary skill in the art would thus be motivated to use this pitch based on the disclosure of Boenigk

Art Unit: 1793

which states that the lower content of this carcinogen better meets environmental standards and is safer to work with. Also, Boenigk specifically obviates the use of his pitch in binders in his abstract (See Abstract)

**Regarding Claim 11:** Kuenkele teaches a method of making a refractory product having a binder comprising a pitch content of 2-7 wt%, carbon content of 1.5-5 wt% and lubricating oil content of .5-2.5 wt%. For example, if 5 wt% pitch and 2 wt% anthracene oil was added, the graphitable binder could be construed as the portion of this composition comprising the 2 wt% anthracene oil and 2 wt% pitch, wherein the other 3 wt% pitch comprises the graphitable pitch. Based on the current claim construction, such an interpretation is valid due to the fact that the claimed subject matter only requires component A and component (A+B) with no extra processing step to make the component (A+B) or any means to distinguish component A among the mixed organic binder (See Column 2, Lines 25-70).

**Regarding Claim 12 and 15:** The pitch used in the process of Kuenkele in view of Boenigk is from Boenigk. Boenigk teaches that the process of attaining said pitch begins by acquiring a pitch from a residue of the primary distillation of coal tar, which normally occurs at an elevated temperature at normal pressures. This coal tar is then distilled in a second distillation stage at a temperature of 300 to 380 Celsius, at a pressure below 1 mbar. This process occurs in various types of evaporators, such as thin layer evaporators, spray film evaporators, and rotating evaporators (See Column 1,

Art Unit: 1793

line 56-Column 2, line 35). Standard tests were then performed to determine the softening point, coking residue and benzo[a]pyrene content of the distilled coal tar.

3). Specific examples were performed showing that the resulting coal tar pitch had the following properties:

Second distillation performed at 300 Celsius (EXAMPLE 1):

BAP-content: 35 ppm

Softening temperature: between 156 and 194

Average stay period (residence time): 5 minutes

Coking value: 83.3%

Second distillation performed at 340 Celsius (EXAMPLE 2):

BAP-content: 20 ppm

Softening temperature: between 193 and 237

Average stay period (Residence time): 5 minutes

Coking value: 88.5%

In the above examples, the softening temperature is taken as being between the beginning of melting and the Termination of Melting as stated by the patent (See Column 2, lines 16-23)

Art Unit: 1793

Therefore, the process of attaining the pitch of Boenigk reads on the claimed process and obviates said process.

**Regarding Claim 13:** The process of Kuenkele in view of Boenigk teaches the use of an anthracene oil as an additive in the process of making refractory bodies (See Column 3, Lines 10-21).

**Regarding Claim 17-18:** In the process of Kuenkele in view of Boenigk, Kuenkele teaches the addition of graphite or other carbon additives to the refractory mixture.

**Regarding Claim 20:** The process of Kuenkele in view of Boenigk would necessarily make a product having an anisotropic coke structure, as it is made of the same components and by the same process.

Claim 14 rejected under 35 U.S.C. 103(a) as being unpatentable over Kunkle in 4115133 in view of Boenigk in 5262043 as applied to claim 1 above, and further in view of Hildinger in 3285760.

Kunkle in view of Boenigk teach a method of creating refractory bodies reading on claim 1. Please refer to the rejection of claim 1 above.

Kunkle in view of Boenigk is silent to the particle size of the pitch used in their process.



The use of the particle size as disclosed by Hildinger in the binder of Kunkele, which would then be used in the production of a refractory body as outlined by would have been obvious to one of ordinary skill in the art in order to create a solidified body, which would not crack or suffer from other deficiencies. The particle size of the pitch is an important parameter, due to the fact that the binder must be used to "bind" refractory particles. An optimal particle size, as taught by 3,285,760 is a pitch passing from a 65% mesh screen, meaning that d50 would be less than 210 microns (See Column 2, Lines 45-50). The use of pitch of this size would ensure that the refractory particles create a uniform refractory body. This body would also exhibit better properties than other carbon bonded refractories, as it would contain fewer carcinogens. All of these inventions represent analogous art, as they all refer to carbon banded refractories. One would be motivated to incorporate the teachings on Hildinger into the cited art in order to form a uniform mixture and body without cracking or other deficiencies. Control over particle size of the binder offers such advantages. Thus this combination would be obvious to one of ordinary skill in the art.

***Allowable Subject Matter***

5. Claim 16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter: The subject matter of Claim 16 effectively introduces a processing step where the graphitable pitch is separate from the component comprising said pitch and anthracene oil. As discussed previously, this limitation is important because the subject matter of claim 1 has a mixture comprising A + (A+B), which can be arbitrarily construed as any amount of A being denoted in either group. Claim 16 changes this situation, so that the first component A is mixed with a third component which is a naphthenic oil and then added to the component of A+B. Furthermore, this step is done prior to the mixing step, which further adds patentable distinction and separates it from the component A+B. Therefore, the step shown in Claim 16 makes this claim allowable if incorporated based on the fact that such a step cannot be anticipated or made obvious over the prior art.

### ***Response to Arguments***

7. Applicant's arguments, see Pages 5-8, filed 5/27/09, with respect to the rejection(s) of claim(s) 10 under 103 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Kunkele. The previous rejection had been withdrawn due to the consisting of language in the claims combined with the fact that the replacement of an organic polymer composition with an anthracene based

Art Unit: 1793

composition would not have been entirely obvious to one of ordinary skill in the art. This has been ameliorated with the current rejection with primary reference Kunkele, who teaches a refractory made from pitch and anthracene oil. The finality of the rejection has been withdrawn based on the content of both the arguments and of the telephonic interview of April 29, 2009.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew E. Hoban whose telephone number is (571) 270-3585. The examiner can normally be reached on Monday - Friday from 7:30 AM to 5 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/586,221

Page 11

Art Unit: 1793

/J.A. LORENZO/

Supervisory Patent Examiner, Art Unit 1793

/Matthew E Hoban/

Examiner, Art Unit 1793